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DATE OF SALE | AFTERNOON AND EVENING OF MARCH 30th

PART IV.
Microscopic
Telescopic
Optical
Conchology
Books Relating to Microscopy and Astronomy

COLLECTION

OF THE LATE

PROFESSOR CHARLES E. WEST

BROOKLYN

AMERICAN ART GALLERIES
MADISON SQUARE SOUTH
NEW YORK

Learning and Labor.
LIBRARY
OF THE
University of Illinois.
CLASS. BOOK. VOLUME.
Accession No.

PART IV.
Microscopic
Telescopic
Optical
Conchology
Books Relating to Microscopy and Astronomy

LIBRARY
OF THE
UNIVERSITY of ILLINOIS.

THE VALUABLE

ART, LITERARY AND SCIENTIFIC PROPERTY NUMISMATICS AND CLASSICAL ANTIQUITIES

BELONGING TO THE ESTATE OF THE LATE

PROFESSOR CHARLES E. WEST

BROOKLYN

TO BE DISPOSED OF AT ABSOLUTE PUBLIC SALE
BY ORDER OF THE EXECUTORS

ON MONDAY, MARCH 25TH, AND FOLLOWING DAYS
AT 2.30 AND 7.30 O'CLOCK, P.M.

AT THE AMERICAN ART GALLERIES
MADISON SQUARE SOUTH

Where the entire Collection will be on View Day and Evening from
Thursday, March 21st, until date of Sale
inclusive (Sunday excepted)

THE SALE WILL BE CONDUCTED BY THOMAS E. KIRBY OF THE

AMERICAN ART ASSOCIATION, MANAGERS

NEW YORK
1901

PRESS OF J. J. LITTLE & CO.
ASTOR PLACE, NEW YORK

CONDITIONS OF SALE.

1. The highest Bidder to be the Buyer, and if any dispute arise between two or more Bidders, the Lot so in dispute shall be immediately put up again and re-sold.

2. The Auctioneer reserves the right to reject any bid which is merely a nominal or fractional advance, and, therefore, in his judgment, likely to affect the Sale injuriously.

3. The Purchasers to give their names and addresses, and to pay down a cash deposit, or the whole of the Purchase-money, *if required*, in default of which the Lot or Lots so purchased to be immediately put up again and re-sold.

4. The Lots to be taken away at the Buyer's Expense and Risk *upon the conclusion of the Sale*, and the remainder of the Purchase-money to be absolutely paid, or otherwise settled for to the satisfaction of the Auctioneer, on or before delivery; in default of which the undersigned will not hold themselves responsible if the Lots be lost, stolen, damaged, or destroyed, but they will be left at the sole risk of the Purchaser.

5. *The undersigned will not hold themselves responsible for the correctness of the description, genuineness, or authenticity of, or any fault or defect in, any Lot; and make no Warranty whatever.*

6. To prevent inaccuracy in delivery, and inconvenience in the settlement of the Purchases, no Lot can, on any account, be removed during the Sale.

7. Upon failure to comply with the above conditions, the money deposited in part payment shall be forfeited; all Lots uncleared within one day from conclusion of Sale shall be re-sold by public or private sale, without further notice, and the deficiency (if any) attending such re-sale shall be made good by the defaulter at this Sale, together with all charges attending the same. This Condition is without prejudice to the right of the Auctioneer to enforce the contract made at this Sale, without such re-sale, if he thinks fit.

THE AMERICAN ART ASSOCIATION,
MANAGERS.

THOMAS E. KIRBY,
Auctioneer.

✓P4204

SPECIAL NOTICE.

THIS being an Executors' sale to close the estate, a cash deposit will be required from every purchaser without exception, and purchases must be settled for previous to delivery.

Intending purchasers wishing to avoid the trouble and confusion of making a deposit during the sale can make arrangements previous to day of sale, with the undersigned, at their office, 6 East Twenty-third Street.

AMERICAN ART ASSOCIATION, *Managers.*

THOMAS E. KIRBY, *Auctioneer.*

CATALOGUE

FIRST SESSION

Saturday Afternoon, March 30th

AT THE AMERICAN ART GALLERIES

BEGINNING PROMPTLY AT 2.30 O'CLOCK

PREFATORY NOTE

By the Compiler of Catalogue, Mr. Ashby, President of the New York and Brooklyn Microscopical Societies

The extensive and varied collection of scientific instruments about to be distributed is a most unique and remarkable one, the gathering together of which covers a period of over half a century, and, as the collection itself will attest, was the life-work of a student, connoisseur, and patron of science.

Here will be found telescopes of the best makers, from a Tolles one-inch to the six-and-one-half-inch object glass made by John Byrne, and spectroscopes from the small pocket instrument to the large model direct-vision Hofmann or the diffraction instrument of Rutherford. The microscopes, objectives, and accessories form a most valuable historical collection, covering a period in microscope and lens construction of upwards of one hundred and fifty years, beginning at about the middle of the eighteenth century with John Dollond's solar microscope and proceeding by easy stages to the present time. Probably the most notable instrument is the original horizontal achromatic microscope of Amici (1827), which marks an epoch. The sixty-five microscope objectives range from the lowest powers to a Tolles 1-50 inch. The names of such famous makers as Charles A. Spencer, Robert B. Tolles, William Wales, Joseph Zentmayer, and Carl Zeiss attest the character of the collection.

I regret that the space at my disposal does not permit me to touch even most briefly upon the varied assortment of microscopical accessories and mounted objects, yet I cannot but mention such gems as the diatom test and type plates of Moller, the celebrated nineteen-band test rulings of Nobert, and Fasoldt's test plate of 120,000 lines to the inch.

While the collection is especially rich in optical instruments, it covers other fields of physical science as well; and heat, sound, electricity, and magnetism are well represented.

GEORGE E. ASHBY.

1 **Telescope.**

Tolles, maker. Object glass, 2½ inches diameter, 23 inches focus. Mounted on stand. Three Tolles solid eyepieces. Solar absorption screen. Terrestrial eyepiece. Eyepiece adapter.

2 **Telescope.**

Brass body. Complete, with finder. In case. John Byrne, maker. First quality object glass, 4¼ inches diameter, 40 inches focus on a star. John Byrne, maker. Five celestial eyepieces. Amplifier. Solar prism. Diagonal prism. Mahogany box. Equatorial stand, with tripod.

3 **Telescope.**

Wood body. Complete, with finder. First quality object glass, 6½ inches diameter; John Byrne, maker. Six celestial eyepieces (2 inches, 1½ inches, 1 inch, $\frac{6}{10}$ inch, $\frac{4}{10}$ inch, and $\frac{2}{10}$ inch). Solar absorption screen. Solar prism. Diagonal prism. Equatorial stand.

4 **Spy Glass.**

Object glass, 1 inch in diameter.

4a **Spy Glass.**

Object glass, 1½ inches in diameter.

5 **Spy Glass.**

Object glass, 1 inch in diameter.

5a **Spy Glass.**

Object glass, 1⅝ inches in diameter.

6 **Spy Glass.**

Object glass, 1¼ inches in diameter. Spencer & Eaton, makers.

7 **Spy Glass.**

Clamp, adjustable, brass, with gimlet screw.

8 **Fraunhofer Telescope.**

Object glass, 1⅜ inches diameter. In case.

9 **Tolles Short-focus Telescope.**

Object glass, 1 inch diameter, 4 inches focus. One additional eyepiece. Handsomely mounted. Morocco case.

9a **Eyepiece for Telescope.**

With solar absorption screen.

10 **Hofmann's Direct-vision Spectroscope.**

Large model, 20 inches long. Provided with scale tube and prism at slit. Handsomely mounted.

11 **Duboscq Spectroscope.**

Prism, $1\frac{9}{10}$ inches. Objective, $1\frac{1}{10}$ inches. Provided with scale tube and prism at slit. Handsomely mounted.

12 **Rutherford Diffraction Spectroscope.**

Adjustable slit and reflection grating. Ruled surface, 1⅛ inches square. Objective, 1⅛ inches. Mahogany box.

13 **Sorby-Browning Micro-Spectroscope.**

Mahogany box.

14 **Spectroscope Eyepiece.**

With side illumination and photographic scale.

15 **McLean's Star Spectroscope Eyepiece.**

John Browning, maker.

16 **Direct Vision Pocket Spectroscope.**

With adjustable slit.

17 **Direct Vision Pocket Spectroscope.**

With adjustable slit.

18 **Apparatus for Testing the Absorptive Power of Liquids for Various Colors.**

With three absorption wedges. Very handsomely mounted in brass. Mahogany case.

19 **Apparatus for Showing the Spectra of Metallic Vapors in the Electric Arc.**

In box.

20 **Parlor Kaleidoscope.**

Walnut stand.

21 **Polariscope Kaleidoscope.**

On stand.

22 **Camera Lucida.**

With clamp for table. Handsomely mounted. Mahogany box.

23 **Dollond's Solar Microscope.**

Complete with mirror and seven objectives. In mahogany case. John Dollond, an English optician, was born at London, June 10, 1706, and died November 30, 1761. Invented the achromatic telescope (1757-1758).

24 **Microscope.**

George Sterrop, maker. In case. This instrument is a close copy of "John Cuff's Microscope" (1744). Coarse adjustment is by sliding tube and fine adjustment by direct acting micrometer screw. Four objectives. Condensing lens and silvered speculum for use with opaque objects. Stage forceps, ivory object holder and other accessories. Also a simple microscope. Original ivory sliders with objects.

25 **Microscope.**

Although differing somewhat in detail, it is similar in general construction to "Jones's Most Approved Compound Microscope and Apparatus" (1798). The base is a folding tripod and the stem carrying the body inclines upon a compass-joint at the base of the pillar. The stage, which is provided with clips, is adjustable by rack and pinion for focusing. Mirror is fixed. A set of six objectives of varying power and two additional objectives have silvered specula for use with opaque objects. Wooden sliders for mounting objects and other accessories. Also a simple microscope which swings on arm in stage. In case.

26 **Amici Horizontal Microscope.**

Original form. In case. Giovanni Battista Amici, an Italian optician and astronomer, was born at Modena, Italy, March 25,

1784, and died at Florence, April 10, 1863. In 1827 he exhibited in London and Paris the dioptric or achromatic microscope which bears his name. The real novelty in this instrument was in the application of a right-angled prism immediately above the objective to deflect the rays through the horizontal body tube. The stage is strictly a micrometer one, having rectangular movements accomplished by fine threaded screws, the milled heads of which are graduated. Stage and mirror adjustable on the stem by rack and pinion for focusing. Stage has revolving diaphragms and ground glass light modifier. Objective is composed of three lenses superposed. One objective is furnished with silvered speculum for illuminating opaque objects. Also several accessory magnifiers. Stage forceps. Polarizing bundle of glass plates and rhomb of Iceland spar.

27 **Charles A. Spencer's Large Model Horizontal Microscope.**

1847. Chevalier pattern. Stage and mirror adjustable on the stem by rack and pinion for focusing. A right-angled prism is set over the objective, as in Amici's instrument. One eyepiece. Mr. Spencer made only six of these instruments.

28 **Charles A. Spencer's Grand Trunnion Microscope.**

Coarse and fine adjustments. Mechanical stage. Substage has rack and pinion. One eyepiece. Zoöphyte trough. In case. Mr. Spencer made only three instruments of this model.

29 **Powell & Lealand Dissecting Microscope.**

London, 1852. Coarse adjustment by rack and pinion. One eyepiece. Three magnifiers. In mahogany case.

30 **Powell & Lealand Grand Model Microscope.**

London, 1852. Coarse and fine adjustments. Mechanical stage actuated by a lever. Four eyepieces. In case.

31 **Zentmayer's Grand Centennial Microscope.**

Coarse and fine adjustments. Revolving and mechanical stage. One eyepiece. Condenser, bull's eye fitted on arm. Condenser, bull's eye, 2¼ inches diameter, on brass stand with universal joint.

32 **Zentmayer Microscope.**

Coarse and fine adjustments. Glass stage with set of revolving diaphragms. One eyepiece.

34 **Bausch & Lomb Opt. Co. Microscope.**

Coarse and fine adjustments. Revolving stage and set of diaphragms. Two eyepieces. Camera lucida. Polariscope.

35 **Prosch Microscope.**

Coarse and fine adjustments. Mechanical stage, revolving diaphragms. Mechanical substage with polarizer (Nicol's prism 18 millimetres across face) mechanically rotated. One eyepiece. Frog plate. Animalcule cage. Stage forceps. Turntable.

36 **Acme Microscope.**

Coarse and fine adjustments. Revolving stage. Three eyepieces. Vertical illuminator. Prism for oblique illumination.

37 **French Microscope.**

Coarse adjustment. Two eyepieces. One and one-half inches and ¼-inch objectives.

38 **Simple Microscope.**

For flowers, insects, etc. Folds in pocket case.

39 **Child's Microscope.**

Queen & Co.

40 **Toy Microscope.**

The following microscope objectives and eyepieces have recently been carefully examined by competent experts, who certify that they are in excellent condition.

MICROSCOPE OBJECTIVES

William Wales, maker.

41 **Three-inch Focus.**

42 **One-inch and One-and-one-half-inch Focus.**

43 **One-tenth-inch Focus.**

Adjustable.

44 **One-tenth-inch Focus.**

Adjustable. Extra front.

45 **One-fifteenth-inch Focus.**
Adjustable.

46 **One-fifteenth-inch Focus.**
Adjustable.

47 **One-thirtieth-inch Focus.**
Adjustable.

W. & G. Wales, makers.

48 **One-and-one-half-inch Focus.**

49 **Four-tenths-inch Focus.**
Adjustable.

50 **One-fifth-inch Focus.**
One hundred and forty degrees aperture, adjustable.

J. Zentmayer, maker.

51 **Three, 4, and 5-inch Focus.**
Combined.

52 **One-and-one-half-inch Focus.**
For gas microscope.

53 **Four-tenths-inch Focus.**
Adjustable.

Charles A. Spencer, maker.

54 **Two-inch Focus.**

55 **Two-inch Focus.**

56 **One-inch Focus.**

57 **One-inch Focus.**

58 **One-half-inch Focus.**
Seventy degrees aperture.

59 **One-fourth-inch Focus.**
Adjustable.

60 **One-fourth-inch Focus.**
One hundred and fifteen degrees aperture.

61 **One-eighth-inch Focus.**
One hundred and thirty-five degrees aperture.

C. A. Spencer & Sons, makers.

62 **One-fourth-inch Focus.**
One hundred and eighty degrees aperture, adjustable.

Amici, maker.

63 **One-tenth-inch Focus.**

64 **One-twelfth-inch Focus.**

Robert B. Tolles, maker.

65 **One-fourth-inch Focus.**

66 **One-fifth-inch Focus.**
Adjustable.

67 **One-sixth-inch Focus.**

68 **One-sixth-inch Focus.**
One hundred and eighty degrees aperture, adjustable.

69 **One-tenth-inch Focus.**
Adjustable.

70 **One-sixteenth-inch Focus.**
Adjustable.

71 **One-twenty-fifth-inch Focus.**
Adjustable.

72 **One-fiftieth-inch Focus.**
Adjustable.

Carl Zeiss, maker.

73 **One-and-one-half-inch Focus.**
Adjustable. "A, star."

74 **One-inch Focus.**
"AA."

75 **One-twelfth-inch Focus.**
Hom. Im.

J. Grunow, maker.

76 **Two-inch Focus.**

77 **One-fourth-inch Focus.**
Immersion, with vertical illuminator.

Miller Bros., makers.

78 **Two-thirds-inch Focus.**

79 **One-eighteenth-inch Focus.**
Adjustable.

80 **One-fortieth-inch Focus.**
Adjustable.

E. Gundlach, maker.

81 **Three-inch Focus.**

82 **Two-inch Focus.**

83 **One-twelfth-inch Focus.**

A. F. Potter, maker.

84 **One-half-inch Focus.**
Adjustable.

Baker, maker.

85 **One-inch Focus.**

J. Swift, maker.

86 **One-fifth-inch Focus.**

R. & J. Beck, makers.

87 **One-tenth-inch Focus.**
Adjustable.

A. Ross, maker.

88 **One-fourth-inch Focus.**
1854.

89 **One-twelfth-inch Focus.**
Adjustable. 1855.

Powell & Lealand, makers.

90 **One-eighth-inch Focus.**
Adjustable.

91 **One-eighth-inch Focus.**
Adjustable. Oil Im.

92 **One-sixteenth-inch Focus.**
Adjustable.

T. Thomas, maker.

93 **One-fourth-inch Focus.**

Makers unknown.

94 **Four-inch Focus.**

95 **Two-inch Focus.**

96 **Two-inch Focus.**

97 **One-inch Focus.**

98 **Two-thirds-inch Focus.**

99 **Four-tenths-inch Focus.**

100 **One-fourth-inch Focus.**

101 **One-fourth-inch Focus.**
Adjustable.

102 **One-fourth-inch Focus.**
Single achromatic.

103 **One-fifth-inch Focus.**
One hundred degrees aperture. Extra front.

104 **One-eighth-inch Focus.**

105 **One-sixteenth-inch Focus.**

105a **One-half-inch Pocket Lens.**

105b **One-inch Pocket Lens.**
Mounted in gold.

105c **One-half-inch Pocket Lens.**
Mounted in gold.

105d **One-inch Pocket Lens.**
Mounted in silver.

MICROSCOPE EYEPIECES

106 **One-fourth-inch Focus.**
Huyghenian.

107 **One-fourth-inch Focus.**
Huyghenian.

108 **One-half-inch Focus.**
Huyghenian.

109 **One-half-inch Focus.**
Huyghenian.

110 **One-half-inch Focus.**
Huyghenian.

111 **One-inch Focus.**
Huyghenian. With micrometer.

112 **One-inch Focus.**
Huyghenian.

113 **One-inch Focus.**
Huyghenian.

114 **One-inch Focus.**
Huyghenian.

115 **Two-inch Focus.**
Huyghenian.

116 **Pair of One-inch Focus.**
Ramsden positive.

117 **Tolles One-half-inch Focus.**
Solid.

118 **Tolles One-half-inch Focus.**

Solid orthoscopic.

119 **Tolles Two-inch Focus.**

Solid orthoscopic.

120 **Tolles Binocular Eyepiece.**

In case. Converts a monocular into an erecting stereoscopic binocular. Can be used with objectives of high power.

121 **Double Eyepiece Adapter.**

122 **Binocular Body.**

Complete, with one pair of eyepieces. Suitable for Zentmayer's centennial stand.

123 **Lister's Erecting Glass.**

To screw into drawtube.

124 **Triple Nosepiece.**

125 **Two Vertical Illuminators.**

126 **Silvered Side Reflector.**

For illumination of opaque objects.

127 **Silvered Side Reflector.**

For illumination of opaque objects.

128 **Parabolic Illuminator.**

With adapter adjusting it to any objective.

129 **Wenham's Paraboloid.**

For dark-ground illumination, with adjustable stop, adapting it to use with objectives of different apertures.

130 **Wenham's Reflex Illuminator.**

For the resolution of tests by oblique light.

131 **Sub-stage Achromatic Condenser.**

With revolving diaphragm.

132 **Tolles four-tenths-inch Achromatic Condenser.**

One hundred and fifty angular aperture. With revolving diaphragm and adapter.

133 **Beck's Achromatic Condenser.**
With centering adjustments and revolving diaphragm with stops.

134 **Beck's Iris Diaphragm.**
Mounted with substage fitting.

135 **Nicol's Prism.**
Twenty millimetres across face. Mounted. In a brass box.

136 **Nicol's Prism.**
Fourteen millimetres across face. In brass box.

137 **Analyzer, with Nicol's Prism.**
Fourteen millimetres across face.

138 **Set of Darker's Selenites.**
Handsomely mounted in a substage fitting with a Nicol's prism. Twenty-two millimetres across face.

139 **Four Zoöphyte Troughs.**

140 **Fiddian's Microscope Illuminator.**
With brass case.

141 **Section Cutter, with Knife.**
Micrometer screw, 40 threads to inch, with milled head graduated into 25 parts. Made for Dr. Charles E. West in 1852.

142 **Large Oak and Glass Microscope Case.**
With two lock drawers for accessories.

143 **Rainey's Blue-glass Light Modifier.**
On brass stand, with ball-and-socket joint.

144 **Fasoldt's Vertical Illuminator.**

145 **Maltwood Finder.**
For refinding a particular object on a slide. In leather case.

146 **Wright's Microscopic Collecting Bottle for Pond Life.**

147 **Holman's Syphon Slide.**
For the examination of living objects.

148 **Animalcule Cage.**
Slip adjustment.

149 **Compressor.**

Parallel adjustment.

150 **Live Trough.**

For showing the circulation in the tail of a goldfish.

151 **Fasoldt Nosepiece.**

Allowing the rapid change of objectives.

152 **Condenser.**

For illumination of opaque objects. On large brass stand, bull's-eye lens about 2 inches in diameter.

153 **Condenser.**

On large brass stand. Ball-and-socket joint. Bull's-eye lens, about 2½ inches diameter.

154 **One Holman's Life Slide and 1 Holman Current Slide.**

155 **Walnut Microscopic Slide Cabinet.**

Drawers, with numbered knobs and tablets for names of objects. Twelve drawers, holding 480 objects flat; and 1 drawer, holding 88 objects in racks.

MICROSCOPICAL PREPARATIONS AS FOLLOWS

156 **Drawer 1.**

Containing 21 vegetable sections; 5 selenites for polariscope.

157 **Drawer 2.**

Containing 40 polariscope objects.

158 **Drawer 3.**

Containing 40 polariscope objects.

159 **Drawer 4.**

Containing 18 micro-photographs; 17 miscellaneous.

160 **Drawer 5.**

Containing 40 vegetable sections.

161 **Drawer 6.**

Containing 37 minerals, opaque.

162 **Drawer 7.**

Containing 33 miscellaneous.

163 **Drawer 8.**

Containing 10 rock sections; 7 coal fossil sections; 5 miscellaneous.

164 **Drawer 9.**

Containing 6 illustrating development of chick, 12 to 48 hours; 34 miscellaneous.

165 **Drawer 10.**

Containing 15 anatomical preparations, human; 17 histological and miscellaneous.

166 **Drawer 11.**

Containing 30 preparations of blood; 6 slips with concave centres and glass cells.

167 **Drawer 12.**

Containing 30 insects; 6 miscellaneous vegetable.

168 **Case.**

Containing 50 preparations, including sponges, foraminifera, polycystina, diatomacea, echinodermata, bryozoa, etc.

169 **Box.**

Containing 6 insect slides.

169a **Box.**

Containing 11 diatoms and miscellaneous slides.

170 **Box.**

Containing 8 insect and 2 vegetable slides.

171 **Box.**

Containing 22 vegetable preparations.

172 **Mahogany Cabinet.**

Solid door. With 14 drawers, some arranged with racks to hold small slides.

173 **Cabinet.**

With shelves to hold 40 rack slide boxes. Solid door.

MICROSCOPIC SLIDES, AS FOLLOWS

174 Box 1.
Containing 18 micro-photographs; 4 histological.

175 Box 2.
Containing 25 parts of insects.

176 Box 3.
Containing 25 diatoms.

177 Box 4.
Containing 25 diatoms.

178 Box 5.
Containing 25 zoöphytes.

179 Box 6.
Containing 24 marine algæ.

180 Box 8.
Containing 25 vegetable.

181 Box 10.
Containing 25 vegetable.

182 Box 11.
Containing 11 scales of fish; 14 parts of insects.

183 Box 12.
Containing 25 miscellaneous.

184 Box 13.
Containing 25 vegetable.

185 Box 14.
Containing 25 diatoms.

186 Box 15.
Containing 25 ferns. In wooden slips.

187 Box 16.
Containing 25 ferns. In wooden slips.

188 Box 17.
Containing 25 ferns. In wooden slips.

189 Box 18.
Containing 25 ferns. In wooden slips.

190 Box 19.
Containing 25 animal.

191 Box 20.
Containing 25 miscellaneous.

192 Box 21.
Containing 25 vegetable.

193 Box 22.
Containing 25 diatoms.

194 Box 23.
Containing 25 animal.

195 Box 24.
Containing 25 vegetable.

196 Box 25.
Containing 25 seeds.

197 Box 26.
Containing 25 pathological.

198 Box 27.
Containing 25 vegetable.

199 Box 28.
Containing 25 miscellaneous.

200 Box 29.
Containing 25 vegetable.

201 Box 30.
Containing 25 parts of insects.

202 Box 31.
Containing 25 scales.

203 Box 32.
Containing 25 diatoms.

204 **Box 33.**
Containing 25 zoöphytes.

205 **Box 34.**
Containing 25 vegetable.

206 **Box 35.**
Containing 25 vegetable.

207 **Box 36.**
Containing 25 pathological.

208 **Box 37.**
Containing 25 miscellaneous.

209 **Box 38.**
Containing 25 insects.

210 **Box 39.**
Containing 25 zoöphytes.

211 **Box 40.**
Containing 25 diatoms on algæ.

212 **Mahogany Microscopic Slide Cabinet.**
With glass panel door; 25 drawers, with numbered knobs and porcelain tablets for names of objects, holding 750 objects flat.

MICROSCOPICAL PREPARATIONS, AS FOLLOWS

213 **Drawer 1.**
Containing 19 Dr. C. Thieresch's injected preparations.

214 **Drawer 2.**
Containing 20 Dr. C. Thieresch's injected preparations.

215 **Drawer 3.**
Containing 18 Dr. C. Thieresch's injected preparations.

216 **Drawer 4.**
Containing 21 Dr. C. Thieresch's injected preparations.

217 **Drawer 5.**
Containing 20 Dr. C. Thieresch's injected preparations.

218 Drawer 6.

Containing 21 Dr. C. Thieresch's injected preparations.

219 Drawer 7.

Containing 20 Dr. C. Thieresch's injected preparations.

220 Drawer 8.

Containing 18 Dr. C. Thieresch's injected preparations.

221 Drawer 9.

Containing 21 Dr. C. Thieresch's injected preparations.

222 Drawer 10.

Containing 20 Dr. C. Thieresch's injected preparations.

223 Drawer 11.

Containing 20 Dr. C. Thieresch's injected preparations.

224 Drawer 12.

Containing 15 Dr. C. Thieresch's injected preparations.

225 Drawer 13.

Containing 8 Dr. C. Thieresch's injected preparations Extra large.

226 Drawer 14.

Containing 20 Dr. C. Thieresch's injected preparations.

227 Drawer 15.

Containing 21 Dr. C. Thieresch's injected preparations.

228 Drawer 16.

Containing 21 Dr. C. Thieresch's injected preparations.

229 Drawer 17.

Containing 28 histological, mostly injected.

230 Drawer 18.

Containing 32 histological.

231 Drawer 19.

Containing 8 tooth sections, by J. Bourgogne; 9 bone sections, by J. Bourgogne; 21 miscellaneous.

232 **Drawer 20.**

Containing 6 insects, opaque; 18 crystallized gold, silver, and copper, opaque; 11 sands and foraminifera.

233 **Drawer 21.**

Containing 10 diatoms, A. C. Cole & Sons; 10 diatoms, J. D. Moller; 10 diatoms and miscellaneous.

234 **Drawer 22.**

Containing 11 diatoms, J. Bourgogne; 15 diatoms, J. D. Moller; 3 diatoms and miscellaneous.

235 **Drawer 23.**

Containing 7 diatoms, arranged; 3 polycystina (2 arranged); 10 miscellaneous.

236 **Drawer 24.**

Containing 20 diatoms, mostly rare forms, A. C. Cole & Sons; 7 diatoms; 3 foraminifera.

237 **Drawer 25.**

Containing 15 diatoms, J. D. Moller; 11 diatoms; 5 miscellaneous; 2 butterfly scales (test objects), J. Beck.

238 **One Slide.**

Diatoms and butterfly scales; arranged as a cross. Harold Dalton, preparer.

239 **Two Slides.**

Podura scales; test objects. R. & J. Beck.

240 **One Slide.**

Containing a series of sections of spines of Echinoidea. J. D. Moller.

241 **One Slide.**

Containing a series of arranged plates, etc., of Holothuridea. J. D. Moller.

242 **One Slide.**

Synapta; anchors and plates, arranged.

243 **One Slide.**

The Lord's Prayer, engraved on glass with a diamond, 227 letters. The writing occupies about the 15,000th part of a square inch.

244 **One Slide.**

The Creed, engraved on glass with a diamond, 478 letters. The writing occupies about the 4,000th part of a square inch.

245 **One Slide.**

Anatomy of the blow fly, displayed complete.

246 **One Slide.**

Polycystina, arranged group.

247 **One Slide.**

Polycystina, arranged group. Opaque.

248 **One Slide.**

Arranged diatoms.

249 **One Slide.**

Arranged diatoms.

250 **One Slide.**

Arranged diatoms.

251 **One Slide.**

Arranged diatoms.

252 **One Slide.**

Arranged diatoms.

253 **One Slide.**

Arranged diatoms.

254 **One Slide.**

Arranged diatoms.

Five parts of P. T. Cleve and J. D. Moller's diatoms. Each part in a separate cloth-covered folio, slides flat in trays. A catalogue accompanies each part.

255 **Part I.**

Slides No. 1 to 48, 48 slides.

256 **Part II.**

Slides No. 49 to 108, 60 slides.

257 **Part III.**

Slides No. 109 to 168, 60 slides.

258 **Part IV.**

Slides No. 169 to 216, 48 slides.

259 **Part V.**

Slides No. 217 to 276, 60 slides.

Two centuries of Prof. H. L. Smith's "Species Typicæ Diatomacearum." Second edition. Geneva, 1876. In card-board folio, slides lying flat in trays.

260 **Century No. 1.**

Slides No. 1 to 100. With catalogue.

261 **Century No. 2.**

Slides No. 101 to 200. With catalogue.

262 **J. D. Moller's Diatomaceen-Probe-Platte, No. 204.**

With catalogue. A collection of 20 diatoms, arranged in a single line, and graduated according to their value as test objects. Mounted in balsam. In morocco case.

263 **J. D. Moller's Diatomaceen-Probe-Platte, No. 256.**

With catalogue. Same as 204.

264 **J. D. Moller's Diatomaceen-Probe-Platte, No. 697.**

With catalogue. Same as No. 204, but mounted dry.

265 **J. D. Moller's Diatomaceen-Typen-Platte, No. 107.**

Contains 392 typical species and varieties, arranged in four quadrangles. Mounted in balsam. In morocco case, with a printed and bound catalogue.

266 **J. D. Moller's Diatomaceen-Typen-Platte, No. 36.**

Same as No. 107. Mounted in balsam. In morocco case, with a printed and bound catalogue.

267 **J. D. Moller's Diatomaceen-Typen-Platte.**

Contains 80 species of Diatoms, arranged in a quadrangle, and has the name of each diatom photographed beneath it. Mounted in balsam. In morocco case.

267a **Five Photo-micrographs of Amphi Pleura Pellucida.**

268 **Set of Photo-micrographs of Nobert's Nineteen-band Test Plate.**

By J. J. Woodward, Assistant Surgeon U. S. Army. With letter of transmittal.

268a **Folio.**

Containing 13 photo-micrographs of test objects.

269 **Nobert's Test Plate of 19 Bands.**

On a glass slip 3 x 1. Consists of a series of 19 bands. In the 19th band the lines are 112,000 to the inch. In morocco case.

270 **Nobert's Test Plate of 19 Bands.**

Ruled on glass, mounted in a brass plate, 3 x 1. In morocco case.

271 **Fasoldt's Test Plate.**

Ruled from 1-10,000 to 1-120,000 of an inch.

272 **W. A. Roger's Stage Micrometer.**

Ruled 100, 200, 1,000, 2,000, 4,000, 6,000, 8,000, and 10,000 lines to the inch.

273 **Standard Micrometer.**

1, 1-10 and 1-100 millimetres. Copied by Charles Fasoldt from the A.S.M. Standard micrometer.

274 **Stage micrometer.**

In millimetres. J. D. Moller.

275 **Stage Micrometer.**

277 **Rutherford's Diffraction Plate.**

26 x 20 millimetres. Mounted in neat brass frame.

279 **Standard Inch.**

Divided 1-4, 1-20, 1-100, and 1-1,000.

280 **B. & S. Steel Scale.**

Two inches. Divided 1-16, 1-32, and 1-64; 1-10, 1-20, 1-50, and 1-100.

281 **D. & S. Steel Square.**

Two inches.

282 **Millimetre Scale.**

One millimetre long. Ruled in 1-10 and 1-100 millimetres.

283 **Ruling on Speculum Metal.**

In 1-100 and 1-1,000 of an inch. Two bands ruled 2,500 to the inch.

284 **Pair of Field-Glass Object Glasses.**

Two inches in diameter, 7 inches focus.

285 **Achromatic Telescope Objective.**

Mounted; 2⅞ inches diameter, 27 inches focus.

286 **Plano-convex Lens.**

Unmounted; 4 inches in diameter, 7 inches focus.

287 **Plano-convex Lens.**

Mounted in brass cell; 2½ inches in diameter, 7 inches focus.

288 **Double Convex Lens.**

Four and one-fourth inches in diameter. Mounted on adjustable brass stand, with universal joint.

289 **Double Convex Lens.**

Three and one-fourth inches in diameter. Mounted on adjustable brass stand with universal joint.

290 **Double Convex Lens.**

Seven inches in diameter, 3 feet focus. Handsomely mounted on adjustable stand.

291 **Double Convex Lens.**

Five inches in diameter, 24 inches focus.

292 **Double Convex Lens.**

Five inches in diameter, 6 inches focus. Mounted on adjustable wooden stand.

293 **Concave Lens.**

Six inches in diameter. Handsomely mounted on adjustable brass stand.

294 **Double Concave Lens.**

One and one-eighth inches in diameter.

295 **Double Concave Lens.**

Five-eighths inches in diameter, mounted with ball-and-socket joint.

296 **Cylindrical Achromatic Lens.**

One inch square.

297 **Two Meniscus Lenses.**

For lantern condensers; 3½ inches in diameter, with wood and brass cells.

298 **Projection Lens.**

Seven inches focus. With rack and pinion.

299 **Projection Lens.**

Mounted; 8 inches focus.

300 **Set of Eaton's Lantern Condensers.**

Five inches diameter.

301 **Single Achromatic Photographic Lens.**

Two inches in diameter, 10 inches focus, 8 x 10 plate.

302 **Single Achromatic Photographic Lens.**

One and one-fourth inches in diameter, 6 inches focus; with revolving diaphragms.

303 **Morrison Wide Angle Photographic Lens.**

Four and one-half inches focus; 6½ x 8½ plate; with revolving diaphragms.

304 **Large Portrait Lens.**

Five and one-eighth inches in diameter, 18 inches focus. With set of diaphragms and cap.

305 **Set of Nine Small Lenses.**

Mounted in front board; for taking multiple pictures.

305a **Dallmeyer Photographic Group Lens, 5 D. No. 19,046.**

With set of diaphragms.

306 **Single Achromatic Projection Lens.**

Two inches in diameter, 9 inches focus. Very handsomely mounted on adjustable brass stand.

307 **Single Achromatic Projection Lens.**

Two and three-eighths inches in diameter, 12 inches focus. Dr. J. G. Hofmann. Handsomely mounted on adjustable brass stand.

308 **Reading Glass.**

Three and one-fourth inches diameter.

CONCLUDING SESSION

Saturday Evening, March 30th

AT THE AMERICAN ART GALLERIES

BEGINNING PROMPTLY AT 7.30 O'CLOCK

309 **Engraver's Glass.**
Two plano-convex lenses, 1½ inches diameter.

310 **Convex Mirror.**
Four inches in diameter. Handsomely mounted on adjustable brass stand.

311 **Concave Mirror.**
Six and one-half inches in diameter. Handsomely mounted on adjustable brass stand.

312 **Plane Mirror.**
Eight inches in diameter. Mounted on adjustable brass stand.

313 **Newton's Rings Apparatus.**
Two and one-half inches in diameter. Mounted on adjustable brass stand.

314 **Newton's Rings Apparatus.**
Two and three-eighths inches in diameter. Very elegantly mounted.

315 **Equilateral Prism.**
Two inches on side, with lens. Handsomely mounted on adjustable brass stand.

316 **Right-angle Achromatic Prism.**
One inch on side, with one lenticular surface. Handsomely mounted on adjustable German silver stand.

317 **Right-angle Achromatic Prism.**

One and five-eighths inches on side, with one lenticular surface. Very handsomely mounted on adjustable brass stand.

318 **Right-angle Achromatic Prism.**

One and three-fourths inches on side, with one lenticular surface. Handsomely mounted on adjustable brass stand.

319 **Flint and Crown Glass Prisms.**

One and one-half inches, for illustrating dispersive power. Very handsomely mounted on adjustable brass stand.

320 **Hofmann's Prism.**

Of five prisms.

321 **Direct-vision Prism.**

Of two prisms.

322 **Double-image Prism.**

Twenty-six millimetre circular aperture.

323 **Double-image Prism.**

Thirty-two millimetres on each side.

324 **Direct-vision Prism.**

325 **Direct-vision Amici Prism.**

326 **Right-angle Prism.**

Thirteen millimetres. Mounted.

327 **Double-image Prism.**

Ten millimetres aperture.

328 **Pair of Double-image Prisms.**

Ten millimetres aperture. In handsome brass mounting.

329 **Pair of Nicol's Prisms.**

Nineteen millimetres across face. Mounted in a neat brass frame, with handle, so that each prism can be rotated at pleasure. With holder for object. Suitable for examination of rings of crystals.

330 **Yellow Flint Glass Prism.**

One and one-half inches.

331 **Quartz Prism.**
Faces 27 x 33 millimetres.

Glass Prism.
Faces 23 x 36 millimetres.
Mounted to fit in adjustable brass stand, with ball-and-socket joint.

332 **Flint Glass Prism.**
Faces 32 x 25 millimetres. Mounted in frame.

333 **Flint Glass Projection Prism.**
Faces 30 x 55 millimetres. Mounted in frame.

334 **Salt Prism.**
Unpolished. Faces 40 x 50 millimetres.

335 **Set of Four Flint Glass Spectroscope Prisms.**
Faces 38 x 50 millimetres.

336 **Two Direct-vision Eaton Prisms.**
Glass and Bisulphide of Carbon. Large size.

337 **Two Direct-vision Eaton Prisms.**
Glass and bisulphide of carbon. Small size.

338 **Double-image Prism.**

339 **Double-image Prism.**
Circular aperture 45 millimetres. Mounted in brass fitting.

340 **Direct-vision Prism.**
One prism.

341 **Two Amici Prisms.**
Triple.

342 **Calc Spar Prism.**
Five pieces.

343 **Combination Right-angle Prism.**

344 **Hollow Glass Prism.**
Mounted on stand.

345 **Projection Polariscope.**

Very beautifully mounted, with rack and pinion for focusing, stage for objects, condensers 3 inches in diameter, and calc spar prism 43 millimetres on the side.

346 **Darker's Projection Kaleidoscope.**

Handsomely mounted in brass with lens.

347 **Projection Apparatus for Showing Diffraction Phenomena and Rings in Crystals.**

With accessories including a Fresnel's bi-prism, sections of crystals, and microscopical preparations and accessories. Mahogany case.

348 **Mirror of Black Glass.**

Four inches in diameter. Very handsomely mounted on brass stand with universal joint.

349 **Polariscope.**

For studying rings of crystals. Consists of bundle of glass plates for polarizer, with a Nicol's prism, 14 millimetres across face, for analyzer. Very elegantly mounted in brass.

350 **Tourmaline Plate and Two Quartz Plates.**

Mounted in cork in a brass cell. For showing Savart's bands.

351 **Sphere of Calcite.**

Eighteen millimetres in diameter. For testing the double refraction in different directions.

352 **Two Diffraction Gratings on Glass.**

Eight millimetres aperture. Mounted to rotate. Dr. J. G. Hofmann.

353 **Case.**

Containing 6 pieces of unannealed glass (Verre trempe) in wooden frames; 6 pieces unannealed glass, unmounted; 5 selenite designs and 1 plate, to rotate, in wooden frames; 5 sections crystals.

354 **Polarizing Mirror.**

355 **Wheatstone Polariscope Clock.**

356 **Six Selenite Designs.**
Dolphin, chameleon, birds, and demon.

357 **Eight Selenite Designs.**
Mounted in large wooden slides.

358 **Selenite Plate.**
Yellow and blue. Mounted in wooden slide for the lantern; 1½-inch circle.

359 **Salacine.**
Mounted in wooden slide for the lantern.

360 **Quartz Lens.**
Eight-inch focus.

Quartz Lens.
Eighteen-inch focus.

361 **Pair of Tourmaline Tongs.**

362 **Pair of Tourmaline Tongs.**
Dr. J. G. Hofmann.

363 **Lot of 11 Plates of Unannealed Glass.**
(Verre trempe.) Mounted in wooden slips.

363a **Cube of Unannealed Glass.**
Seven-eighths inch.

364 **Lot of 4 Plates of Unannealed Glass.**
(Verre trempe.) Mounted in cork. Dr. J. G. Hofmann.

365 **Plate of Bi-Quartz, natural, and Plate of Quartz, échelle de rotation.**
Dr. J. G. Hofmann.

366 **Plate of Quartz.**
Right-handed.

Plate of Quartz.
Left-handed.

367 **Two Plates of Quartz and One Compound Quartz Plate.**
Giving spirals of airy.

368 **Plates of Quartz, Topaz, Calc-spar, Aragonite, Nitre, and Borax.**

369 **Three Sections of Crystals.**

370 **Set of 15 Plates.**

By Dr. J. G. Hofmann. Comprising quartz, compound of quartz giving spirals of airy, mica, topaz, aragonite, Iceland spar, sugar, santonine, platino-cyanide of magnesium, and platino-cyanide of barium.

371 **Brass Frame, with Screw Press.**

To show effect of strain upon a bar of glass, for polariscope.

372 **Brass Frame, with Handle.**

To show the effect of heat upon glass, with polariscope.

373 **Induction Coil.**

Coil 17½ inches long. With Foucault mercury brake and commutator.

374 **Induction Coil.**

Coil 8½ inches long. With magnetic brake, Ritchie hand brake, switch, and commutator.

375 **Cup Terminals for Induction Coil.**

376 **Ritchie's Magneto-electric Motor.**

377 **Magneto-electric Motor.**

With bell attachment.

378 **Magneto Generator.**

For medical purposes.

379 **Apparatus for Magnetizing Steel Bars.**

380 **Coil.**

For magnetizing large steel bars.

381 **Page's Electric Motor.**

382 **Coil.**

For use under compass needle.

383 **Apparatus.**

For proving the laws of magnetic induction.

384 **Apparatus.**
For showing deflection of magnetic needle.

385 **Set of Seven Ornamental Sparking Tubes.**
With rotating rod. Mounted.

386 **Set of Five Ornamental Sparking Tubes.**
With rotating rod. Mounted.

387 **Support for Bobbing Electric Spiral.**

388 **Deflagrator.**
For static experiments.

389 **Morse Printing Telegraph.**

390 **Telegraph Sounder.**

391 **Telegraph Sounder.**

392 **Telegraph Key.**

393 **Rotator.**
For vacuum tubes.

394 **Induction Coil.**
One-fourth-inch spark.

395 **Vacuum Tube.**
For showing that a spark will not pass through a perfect vacuum.

396 **Two Horse-shoe Magnets.**

397 **Jamin Compound Magnet.**
With keeper.

398 **Lodestone Magnet.**
Mounted, with iron poles, with keeper.

399 **Large Electro Magnet.**
With eight coils and adjustable micrometer poles. Core, 12 inches by 1½ inches. With copper swing and frame.

400 **Frictional Electric Machine.**
Glass plate, 18 inches in diameter.

401 **Holtz Machine.**
Plates 20 inches in diameter. Original form.

402 **Apparatus.**
For piercing glass with electric spark.

403 **Electric Insulating Stand.**

404 **Contin Hollow Sphere.**

405 **Electrical Deflagrator.**

406 **Electrical See-saw.**

407 **Electric Cannon.**

408 **Unit Jar.**
For static electricity.

409 **Leyden Jar.**
With ball connected with inside coating by insulated point, instead of chain.

410 **Two Leyden Jars.**
One ornamental.

411 **Leyden Jar.**
This jar is one of a set of sixty-four which belonged to Priestly. Was made by Dr. Franklin.

412 **Electric Swing.**

413 **Franklin Pane.**

414 **Spark Motto Plate.**

415 **Model Lightning Rods.**
Showing three kinds of insulators.

416 **Brass Cylinder.**
Thirty inches long, with pith balls, for showing static induction.

417 **Pair of Brass Cylinders.**
Eleven inches long, insulated.

418 **Lot of Sixteen Pieces of Apparatus.**
For static experiments.

419 **Uranium Goblet.**

420 **Uranium Egg.**

421 **Tinfoil Shade.**

For proving that electric charge is limited to surface of conductor.

422 **Apparatus.**

For proving Ampere's laws.

423 **Medical Coil.**

424 **Split-ring Commutator.**

425 **Electric Condenser.**

Consisting of 10 Franklin panes, 8 x 10 inches. In wooden box.

426 **Thermo Battery of 120 Elements.**

427 **Six Cells of Bunsen Battery.**

428 **Glass Case.**

With mirror back, glass shelves and doors, containing 20 Geisler tubes, plain and ornamental, from 6 inches to 36 inches in length.

429 **Galvanometer.**

In leather-covered case.

430 **Small Electric Motor.**

431 **Woodhouse & Rawson Incandescent Lamp.**

Thirty volts.

432 **Five Eaton Telephone Receivers.**

433 **Compass, with Sun Dial.**

434 **Two Specimens of Atlantic Telegraph Cable.**

With fac-simile of letter from Cyrus W. Field attesting them as genuine.

435 **Ladd's Chemical Balance.**

Fourteen-inch beam. Agate bearings and agate knife-edges. Beam graduated throughout its length, for use with two riders.

436 **Set of Oertling's Weights.**

Two hundred grammes down to 1 milligram, with riders.

437 **Mercury barometer.**

With centigrade thermometer scale. James Green, New York, maker. In handsome carrying case.

438 **Thermometer.**

Centigrade, 0 to 50 degrees. Graduated to one-fifth degrees.

439 **Eudiometer.**

440 **Actinometer.**

441 **Custom House Spirit Hydrometer.**

With thermometer attached.

442 **Hydrometer for Vinegar.**

443 **Saccharometer.**

444 **Lactometer.**

445 **Glass Mortar and Pestle.**

446 **Franklin Pulse Glass.**

447 **Blow Pipe, Brass.**

448 **Apparatus.**

For showing that radiant heat will pass through a vacuum.

449 **Psychrometer.**

Dry and wet bulb thermometers. Very handsomely mounted. In mahogany case.

450 **Set of Mounts.**

Illustrating Wollaston's method of drawing platinum wire.

451 **Brass mounting.**

Containing slit and condensers for the projection of the solar spectrum.

452 **Small Crova Disc.**

453 **Lillibridge's Color Blending Spinner.**

454 **Set of Six Phosphorescent Tubes.**

455 **Spice's Apparatus.**

For the screen projection of Lissajou's figures.

456 **Brass Spiral.**
For illustrating nodes and ventral segments.

457 **Brass Clamp.**
For holding Chladni plates.

458 **Support and Weight for Pendulum.**
To prove Huyghens's principle.

459 **Copper Flask and Connection.**
For making oxygen.

460 **Silver Basin.**
Poised on adjustable stand, for repeating Tyndall's experiment on the spheroidal state.

461 **Melde Fork.**
With stand and thread.

462 **Pair of Bunsen Burners.**
For spectroscope work.

463 **Single Tube Bunsen Burner.**
Set of Four Bunsen Stoves.
Four-tube Bunsen Burner.

464 **Eliptograph.**

465 **Beam Compass.**
Of wood.

466 **Pair of Spice's Steel Sympathetic Tuning Forks.**
Mounted on resonant cases.

467 **Set of Ten Bell Metal Tuning Forks.**
Mounted on resonant cases.

468 **Tuning Fork.**
C Philharmonic.
Tuning Fork.
Organ Pipe.
With glass front, for showing nodes.

469 **Centrifugal apparatus.**
Including ring, glass sphere, and four wooden forms.

470 **Air Pump.**

Plate 7¼ inches in diameter. Cylinder 2¼ x 6 inches.

471 **Large Lever Air Pump.**

Plate 13 inches in diameter. Cylinder 4 x 13 inches, with mercury gauge.

472 **Bench of Six Chladni Plates.**

473 **Pair of Magdeburg Hemispheres.**

Brass.

474 **Eudiometer.**

474a **Sextant.**

Ebony, with ivory scale.

475 **Regnault's Apparatus.**

For showing the dependence of the boiling point on pressure for pressures greater than the atmosphere. Provided with thermometer, mercury manometer, and steam whistle.

476 **Spirit Level.**

Handsomely mounted. Brass, in case.

477 **Spirit Level.**

Mounted.

478 **Surveying Level.**

Telescope, 16 inches long.

479 **Crook's Radiometer.**

480 **Pair of Proportional Dividers.**

481 **Adjustable Table of Wood.**

482 **Adjustable Table of Brass.**

483 **Adjustable Table of Brass.**

484 **Hollow Glass Absorption Wedge.**

485 **Specimen of Metallic Thallium.**

486 **Trevelyan Rocker.**

With lead and wooden blocks.

487 **Thermo-pile.**
Consisting of 56 pairs. Mounted on brass stand with cone.

488 **Thermo-pile.**
Consisting of 42 pairs.

489 **Thermo-pile.**
Small, consisting of 9 pairs.

490 **Cylinder of Uranium Glass.**
Two inches.

491 **Brass Siren.**

492 **Forty-seven Reagent Bottles.**
With enamel labels, 32 of which have formula on the stopper. With rack stand.

493 **Copper Water Bath.**
Five and one-half inches in diameter, with four rings.

494 **Adjustable Stand.**
With clamp.
Two Retort Stands.
Also large clamp.

494a **Model Stationary Steam Engine.**

495 **Large Camera Box.**

495a **Dallmeyer 4 x 5 Camera.**
With 4 plate holders and Dallmeyer rapid rectilinear lens, with set of diaphragms. In carrying case.

496 **Large Camera Box.**

496a **Heliostat.**
Handsomely mounted in brass, clock-work attachment. In case.

497 **Hawkridge College Lantern.**
Oxy-hydrogen, for physical projection. Condensers 5 inches in diameter. New York Optical Works projection lens, 9 inches focus. Jet with clock-work for turning lime. Vertical attachment.

498 **Hawkridge College Lantern.**

For physical projection. Oxy-hydrogen and solar. Condensers, 5 inches diameter. New York Optical Works projection lens, 9-inch focus. Jet with clock-work for turning lime; also arranged for solar projection with additional condensers and a handsomely mounted heliostat, hand adjustment, and two condensers with cones.

499 **Glass Cell for Lantern.**

Six by six inches, with four clamps and rubber packing.

500 **Glass Cell for Lantern.**

Six by six inches, rubber packing. Mounted in wood frame, with plano-convex lens, 4 inches diameter.

501 **Glass Cell for Lantern.**

Five by four and one-half inches, with four clamps and rubber packing.

502 **Glass Lantern Trough.**

Three and one-fourth by two and one-half inches, with brass frame and rubber packing.

503 **Mirror.**

Mounted, for vertical attachment of lantern.

504 **Two Frames.**

With color screens, for tinting lantern views.

505 **Galvanometer.**

For use with the vertical lantern.

506 **Polarizing Elbow.**

For lantern.

507 **Adjustable Slit.**

For lantern, 60 millimetres long.

508 **Set of Revolving Diaphragms.**

Mounted for the lantern.

509 **Polarizing Bundle of Glass Plates.**

510 **Rotating Lantern Apparatus.**

With four color discs.

511 **Set of 13 Objects.**

Mounted between circular discs of glass for lantern projection. Consisting of sea-weeds, sections of woods, ferns, and whole insects.

512 **Oxy-hydrogen Dissolving Key.**

513 **Pair of Regulators.**

For gas cylinders.

514 **Pair of Wheel Wrenches.**

For gas cylinders.

515 **Pressure Gauge.**

For testing gas cylinders.

516 **Lantern Slides.**

Forty-four European views, Berlin, Cologne, Rhine, Heidelberg, Milan, Rouen.

517 **Lantern Slides.**

Seventy views Swiss Alps, etc., Levy & Co.; 1 Lake Dwellers (drawing).

518 **Lantern Slides.**

Sixty-eight views France; 29 statuary.

519 **Lantern Slides.**

Forty-two views Spain, Granada, and The Alhambra.

520 **Lantern Slides.**

Ten views Constantinople; 17 Russia.

521 **Lantern Slides.**

Forty-two views "Trip from London to Rome." Eight slides missing from this set.

522 **Lantern Slides.**

Twenty-three views Rome, Vatican, St. Peter's, St. John Lateran. 9 miscellaneous.

523 **Lantern Slides.**

Eighty views Rome.

524 **Lantern Slides.**

Twenty-nine views Rome.

525 **Lantern Slides.**
Thirty-eight celebrated paintings, Sistine Chapel.

526 **Lantern Slides.**
Fifteen views Egypt and Assyria; 29 views Syria and Palestine.

527 **Lantern Slides.**
Sixty views Egypt.

528 **Lantern Slides.**
Sixty-seven views, mostly Egypt.

529 **Lantern Slides.**
Fifty views, the Pyramids, Egypt. A complete numbered set.

530 **Lantern Slides.**
Seventy Greek subjects.

531 **Lantern Slides.**
Forty-nine Trojan objects, pottery, etc.

532 **Lantern Slides.**
Fifty-four views India.

533 **Lantern Slides.**
Sixty-nine views India.

534 **Lantern Slides.**
Seventy-four views India.

535 **Lantern Slides.**
Fifty-one views Japan.

536 **Lantern Slides.**
Nineteen views Yosemite and Pacific Railroad.

537 **Lantern Slides.**
Thirty-six views Yellowstone Park and Geysers; 14 Pacific Railroad.

538 **Lantern Slides.**
Forty-seven archæological, South America.

539 **Lantern Slides.**
Fifty-one gealogical.

540 **Lantern Slides.**
Seventy-nine geological.

541 **Lantern Slides.**
Sixteen classification natural history; 12 histological.

542 **Lantern Slides.**
Eighteen photo-micrographs.

543 **Lantern Slides.**
Seven statuary, blacked background; 39 statuary.

544 **Lantern Slides.**
Twelve statuary, blacked background; 74 statuary.

545 **Complete Set of 28 Geometrical and Astronomical Slides.**
In wooden frames, some colored. With catalogue. In case.

546 **Complete Numbered Set of 33 Astronomical Slides.**
Colored, in wooden frames, three mechanical. In case.

547 **Four Tinters.**
In wooden frames.

548 **Revolving Slide.**
For kaleidoscope projection. In wooden frame.

549 **Two Mechanical Slides.**
Geometrical chromatropes. Wooden frames.

550 **Mechanical Slide.**
To illustrate the mechanism of a steam-engine cylinder.

551 **Photographs of Nobert's 19-Band Plate.**
Wooden frames.

552 **Lantern Slides.**
Five statuary, blacked background, wooden frames.

553 **Lantern Slides.**
Two dissolving views. vase of flowers, in bud and full bloom. Colored.

554 **Lantern Slides.**
Four dissolving views, "Water Babies." In wooden frames.

555 **Lantern Slides.**

Four dissolving views, "Mercury." Three blacked background, 1 colored. In wooden frames.

556 **Lantern Slides.**

Four dissolving views, "Flying Time." Three blacked background and 1 colored. In wooden frames.

557 **Lantern Slides.**

Four dissolving views, "Aurora." Three blacked background and one colored. In wooden frames.

558 **Lantern Slides.**

Three dissolving views, World. Blacked background. In wooden frames.

559 **Lantern Slides.**

Two dissolving views, Angel of Peace. Colored. In wooden frames.

560 **Lantern Slides.**

Two dissolving views, Beethoven's Dream. Colored. In wooden frames.

561 **One Colored View.**

"Shepherd's Bible," Landseer. In wooden frame.

562 **One Colored View.**

"Forester's Family," Landseer.

563 **One Slide.**

"Mercy's Dream."

564 **One Slide.**

"No Cross, No Crown."

565 **Two Mechanical Slides.**

566 **Seven Small Geometrical Chromatropes.**

567 **Lantern Slides.**

Thirty-two portraits, mostly of famous scientists.

568 **Lantern Slides.**

Eighty-two ancient coins, British Museum.

569 **Lantern Slides.**

Forty-five statuary, etc., British Museum, Elgin, Egyptian, Greek, Roman, and Assyrian rooms.

570 **Lantern Slides.**

Fifty-four Rembrandts, etchings, etc.

571 **Lantern Slides.**

Eighteen portraits of Christ; 28 paintings, life of Christ, etc.

572 **Lantern Slides.**

Sixty-one views of Palestine. A complete numbered set.

573 **Lantern Slides.**

Forty-three views of Greece.

574 **Lantern Slides.**

Ninety-eight views of Italy.

575 **Lantern Slides.**

Fifty-three views serpent worship.

576 **Lantern Slides.**

Sixty-three views serpent worship.

577 **Lantern Slides.**

Thirty views Niagara Falls, etc.

578 **Lantern Slides.**

Forty-one views of Moon; 5 miscellaneous.

579 **Lantern Slides.**

Eleven spectroscopic, some colored.

580 **Lantern Slides.**

Fifteen optical slides, illustrating lens construction, etc.

581 **Lantern Slides.**

Fifty-eight geological and natural history.

582 **Lantern Slides.**

Six cloud photographs.

583 **Lantern Slides.**

Twenty-seven geological.

584 **Lantern Slides.**
Fifteen German allegorical.

585 **Lantern Slides.**
Fifteen Troy and miscellaneous.

BOOKS RELATING TO MICROSCOPY AND TELESCOPY

586 **American Journal of Microscopy and Popular Science** (The). Vols. I–V. (December, 1875–December, 1880.) New York, 1876–80.
5 vols., 8vo, cloth.

587 **American Quarterly Microscopical Journal** (Vol. I.). 1878. **American Monthly Microscopical Journal.** Edited by Romyn Hitchcock. (Vols. I. [1880]–V.). New York, 1878–84.
63 Nos. Vol. IV., No. 7, missing. 8vo, paper.

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